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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/536,000	03/27/2000	Andrew D. Bailey III	LAMIP130/P0566	6323

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/27/2002

11

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-11

Office Action Summary

Application No.

09/536,000

Applicant(s)

BAILEY ET AL.

Examiner

Luz L. Alejandro

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 28-36 is/are pending in the application.
- 4a) Of the above claim(s) 12-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 28-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7,8. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the invention of claims 1-11 and 28-36 in Paper No. 10 is acknowledged. For clarification purposes, it is pointed out by the examiner that claims 12-18 were previously mistakenly indicated to be generic claims. As correctly elected by applicant, the proper claims that are directed to the elected embodiment are claims 1-11 and 28-36, since as indicated above, claims 12-18 are not generic claims.

Claims 12-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-11 and 28-36 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Bailey, III et al., U.S. Patent 6,341,574 B1.

Bailey, III et al. shows the invention as claimed including a plasma processing apparatus 100 for processing a substrate comprising the claimed limitations, for example, magnet elements arrangement 132 including 32 permanent magnets (see col. 8-lines 36-48) around the outside of a chamber wall, and wherein each of the plurality of magnet elements spans substantially from the top end of the bottom end of the process chamber; and a device for changing a cusp pattern with respect to said wall between the plurality of magnetic elements and the processing chamber, wherein said device rotates each magnetic element individually around an individual axis of rotation passing through the magnetic element (see col. 14-line 66 to col. 15-line 6 and fig. 6c). For a complete description of the apparatus, see the entire document.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-8, 28-29, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Setoyama et al., U.S. Patent 6,196,155 in view of Sakai, U.S. Patent 5,855,725.

Setoyama et al. shows the invention as claimed including a plasma processing apparatus for processing a substrate 4 comprising: a wall defining part of the process chamber within which a microwave device is used for igniting and sustaining within the process chamber a plasma for the processing; a magnetic array having a plurality of magnetic elements 20a and 20b, that are disposed within the periphery of the chamber, the plurality of elements being configured to produce a magnetic field establishing a plurality of cusp patterns on the wall; and devices 14 and 15, for rotating the magnetic elements as to change the cusp pattern of the magnetic field, and which can move the magnetic array closer and farther away from the chamber (see figs, 1-2 and their descriptions).

Setoyama et al. does not expressly disclose that the plurality of magnet elements expands substantially from the top end and the bottom end of the process chamber. Sakai discloses a magnet array 5 that spans from the top end to the bottom end of the process chamber 1 (see fig. 1). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Setoyama et al. so as to include a magnet array where each magnet spans from the top to the bottom end of the processing chamber because such magnet arrangement is suitable to produce a magnetic field.

Furthermore, Setoyama et al. does not expressly disclose that the substrate support is a chuck, but the examiner takes official that such means is well known and used in the art for securely supporting and holding substrates in the processing chamber, and its inclusion in the apparatus disclosed by the Setoyama et al. reference would be prima facie obvious. Also, Setoyama et al. does not expressly disclose that the devices 14 and 15 are connected between the plurality of magnetic elements and the process chamber, but there is no evidence that such device arrangement would affect the overall performance of the apparatus.

Setoyama et al. further discloses that the magnetic elements are permanent magnets which are axially oriented about the periphery of the process chamber. Also, it is inherent from fig. 1 that the plurality of magnetic elements create a stronger magnetic field at the wall and a weaker magnetic field above the substrate, and that the magnetic field has an azimuthally symmetric radial gradient.

With respect to claim 32, Setoyama et al. does not expressly disclose that the magnetic field at the wall is between about 15 to 1500 Gauss. Regarding this processing parameter, and as stated above, Setoyama et al. discloses that the magnetic field strength can be changed by using the devices 14 and 15. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the magnetic field based on the process being performed through routine experimentation.

With respect to claims 6-7, such limitations are directed to a method limitation which are view as intended uses and do not further limit, therefore do not patentably distinguish the claimed invention. Note that the device for rotating the magnetic elements can be configured to perform the claimed limitations.

Claims 5, 9-11, and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Setoyama et al., U.S. Patent 6,196,155, in view of Sakai, U.S. Patent 5,855,725 as applied to claims 1-4, 6-8, 28-29, and 35-36 above, and further in view of Sekine et al., U.S. Patent 5,660,744 or Barankova et al., WO 99/27758 or Bailey, III et al., U.S. Patent 6,341,574 B1.

Setoyama et al. and Sakai are applied as above but do not expressly disclose that each magnetic element is individually rotated around an individual axis of rotation passing through the magnetic field. Sekine et al. discloses an apparatus in which the magnetic field can be rotated by individually rotating each of the magnet elements on its own axis without changing the respective positions of the magnet elements (see col. 25-

lines 29-32). Barankova et al. shows an apparatus comprising permanent magnets 1 and 2 which rotate about their own axis to change the magnetic field inside the process chamber (see figs 1, 4, and 6-7 and their description). Furthermore, Bailey, III et al. discloses an apparatus in which the magnets rotate about their own axis to change the magnetization pattern (see col. 14-lines 66 to col. 15-line 6 and fig. 6c). Therefore, in view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Setoyama et al. modified by Sakai as to include a magnet system in which each magnet is individually rotatable about its own axis because in such a way the magnetic field can be rotated without changing the respective positions of the magnet elements, and in order to change the magnetization pattern, therefore, optimizing the apparatus.

With respect to claim 5, Bailey III et al. discloses an arrangement of 32 permanent magnets (see col. 8-lines 36-48). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Setoyama et al. modified by Sakai so as to include a magnet array of 32 permanent magnets because this is a suitable arrangement for generating a magnetic field. Furthermore, duplication of parts has been held to have been obvious, and therefore a prima facie case of obviousness exists.

Response to Arguments

Applicant's arguments with respect to claims 1-11 and 28-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


LLAM

June 23, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700